WHAT IS CLAIMED IS:

Sub a4

1. A hard multilayer coating comprising at least one first coating layer and at least one second coating layer which are alternately superposed on each other,

wherein each of said at least one first coating layer consists of $(Ti_x Al_{1-x}) (C_y N_{1-y})$ wherein $0.20 \leqq x \leqq 0.60$, $0 \leqq y \leqq 0.5$, while each of said at least one second coating layer includes or consists of CrN,

and wherein one of said at least one first coating layer constitutes an outermost layer of said hard multilayer coating.

2. A hard multilayer coating according to claim 1, wherein said at least one first coating layer consists of a plurality of first coating layers, one of which constitutes an innermost layer of said hard multilayer coating.

3. A hard multilayer coating according to claim 1, wherein each of said at least one first coating layer has an average thickness of 10-2000nm while each of said at least one second coating layer has an average thickness of 10-1000nm, and wherein said hard multilayer coating has a total thickness of 0.5-20μm.

4. A hard multilayer coating according to claim 1, wherein each of said at least one second coating layer further

includes $(Ti_x Al_{1-x})(C_y N_{1-y})$ wherein $0.20 \leqq x \leqq 0.60$, $0 \leqq y \leqq 0.5$.

5. A hard multilayer coated tool comprising:

the hard multilayer coating defined in claim 1; and

a substrate having a surface coated with said hard multilayer coating.

6. A method of forming the hard multilayer coating defined in claim 1, on a surface of a substrate, by using an arc-type ion plating apparatus which includes: (a) a first arc-discharge power source for supplying an arc current to a first cathode formed of $Ti_x Al_{1-x}$ wherein $0.20 \leqq x \leqq 0.60$; (b) a second arc-discharge power source for supplying an arc current to a second cathode formed of Cr; (c) a bias-voltage power source for applying a negative bias voltage to said substrate; (d) a rotary device for rotating said substrate about a predetermined axis; and (e) a reaction-gas supplying device for supplying a reaction gas into a chamber which accommodates therein said substrate and said first and second cathodes, said method comprising:

a switching step of switching on and off said first and second arc-discharge power sources such that said first and second coating layers are alternately superposed on each other,

wherein a thickness of said first coating layer is adjusted by controlling at least one of a time for which said first arc-discharge power source is held on, and said arc current supplied from said first arc-discharge power source,

and wherein a thickness of said second coating layer is adjusted by controlling at least one of a time for which said second arc-discharge power source is held on, and said arc current supplied from said second arc-discharge power source.

7. A method according to claim 6, wherein said switching step includes a simultaneously switching step for switching on both of said first and second arc-discharge power sources such that each of said at least one second coating layer has a composition consisting of a mixture of said CrN and $(Ti_x\ Al_{1-x})\ (C_y\ N_{1-y})$ wherein $0.20 \leqq x \leqq 0.60$, $0 \leqq y \leqq 0.5$, and wherein proportions of said CrN and said $(Ti_x\ Al_{1-x})\ (C_y\ N_{1-y})$ in said composition are adjusted by controlling an amount of said arc current supplied from said first arc-discharge power source and an amount of said arc current supplied from said second arc-discharge power source.

8. A method according to claim 6, wherein said first and second cathodes are positioned on respective opposite sides of said substrate in a direction perpendicular to said predetermined axis about which said substrate is rotated by said rotary device.